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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,869	04/12/2004	Il Kwon Jeong	123056-05004421	1805

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EXAMINER

BROOME, SAID A

ART UNIT PAPER NUMBER

2671

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/821,869	<b>Applicant(s)</b> JEONG ET AL.	
	<b>Examiner</b> Said Broome	<b>Art Unit</b> 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desbrun et al.(US Patent 6,573,897) in view of Pfister et al.(US Patent 6,342,886).

Regarding claim 1, Desbrun et al. teaches all the limitations except initializing and calculating torques acting on the material points and accumulatively calculating the forces and torques acting on the material points. Desbrun et al. teaches an animation method of deformable objects using an oriented material point and generalized spring model in column 1 lines 16-19 and column 2 lines 10-12, as recited in the preamble. Desbrun et al. also teaches modeling a structure of a deformable object into oriented material points and generalized springs in column 2 lines 7-12. Desbrun et al. teaches initializing and calculating forces acting on the material points in column 2 lines 26-28. Desbrun et al. also teaches adding the calculated forces to the corresponding material points and executing numerical integration based upon calculation results

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in order to obtain new positions and postures of the material points in column 2 lines 13-16 and 31-35. Desbrun et al. teaches updating positions, velocities, postures and angular velocities of the material points based upon the calculation results in the step (b) in column 2 lines 7-10 and column 3 lines 56-58. Desbrun et al. teaches in column 2 lines 22-24 displaying updated results regarding the offset, or corrected positions in response to forces, of the material points as described in column 2 lines 31-35 where it is described that the new positions or offset of the material points in response to forces are updated. Desbrun et al. also teaches inspecting termination conditions and if the termination conditions are not satisfied, repeating the steps (b) to (d) in column 4 lines 34-40. Again, Desbrun et al. fails to teach initializing and calculating torques acting on the material points and accumulatively calculating the forces and torques acting on the material points. Pfister et al. teaches providing torques that act on deformable objects in column 12 lines 48-52, therefore they are also initialized. Pfister et al. also teaches accumulatively calculating the forces and torques, which are forces of angular acceleration, acting on the material points with respect to the springs in column 16 lines 39-45. It would have been obvious to one of ordinary skill in the art to combine the teachings of Desbrun et al and Pfister et al. because this combination would provide animated deformable objects that are represented using a mass spring model that would react realistically under applied internal and external forces after calculating and continuously applying those forces during animation.

Regarding claim 5, Desbrun et al. teaches storing data about positions of the material points obtained in the step (b) in column 14 lines 63-67 and column 15 lines 1-8.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desbrun et al.(US Patent 6,573,897) in view of Pfister et al.(US Patent 6,342,886), in further view of Reynolds et al.(US 2002/0180739).

Regarding claim 3, Desbrun et al. and Pfister et al. teach all the limitations except applying offsets including rotational transformation and position transformation to the respective material points to output the material points in various forms as if they exist in offset positions. Reynolds et al. teaches applying offsets including rotational transformation and position transformation to the respective material points to output the material points in various forms as if they exist in offset positions in paragraph 0052 lines 1-13, where it is described that new rotational and translational orientations change the material points of the shape in response to a new position, movement or offset and change the points in response to that movement. It would have been obvious to one of ordinary skill in the art to combine the teachings of Desbrun et al., Pfister et al. and Reynolds et al. because this combination would provide accurate modeling of a deformable object that is realistically animated in response to both internal and external forces.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desbrun et al.(US Patent 6,573,897) in view of Pfister et al.(US Patent 6,342,886), in further view of Desbrun et al. ("Interactive animation of structured deformable objects"), herein referred to as Desbrun.

Regarding claim 4, Desbrun et al. teaches deformable objects that are two and three-dimensional objects in column 2 lines 7-12. Desbrun et al. and Pfister et al. fail to teach deformable one-dimensional objects. Desbrun teaches one-dimensional deformable objects on page 2 section 2 lines 3-6 and it is also illustrated in Figure 3. It would have been obvious to one

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of ordinary skill in the art to combine the teachings of Desbrun et al., Pfister et al. and Reynolds et al. because this combination would provide the ability to animate a wide variety of objects in one, two and three dimensions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Said Broome whose telephone number is (571)272-2931. The examiner can normally be reached on 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571)272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Broome *SB*  
1/13/06

  
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